# TASK COMPLETION REPORT FOR TASK 1

# RICHARDSON FLAT TAILINGS SITE

EPA SITE ID: UT980952840

June 18, 2008

**Prepared for:**

**United Park City Mines**
**P.O. Box 1450**
**Park City, UT 84060**

**Prepared by:**

**Resource Environmental Management Consultants d.b.a. RMC**
**8138 South State Street, Suite 2A**
**Midvale, Utah 84047**

**Phone: (801) 255-2626**
**Fax: (801) 255-3266**

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Prepared by:_____ Date: 5-28-08
Jim Fricke
Resource Management Consultants

Reviewed by:_____ Date:
Kerry Gee
United Park City Mines Company

Reviewed by: _____ Date:
Kathryn Hernandez
USEPA Remedial Project Manager

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## 1.0 INTRODUCTION

This Task Completion Report (TCR) details the work completed for Remedial Task 1 at Richardson Flat, ID UT980952840. Task 1 remedial features are presented in Figure 1-1. The remedy selected by United States Environmental Protection Agency (EPA) at the Richardson Flat Tailings Site, (Site) was split into Tasks to facilitate remedy completion and bond release procedures. The Site is located approximately three miles northeast of Park City, Utah.

Construction procedures and methodologies documented in this report were described in the Task 1 Field Construction Plan (Task 1 FCP, RMC, 2007a). A full description of Site background, investigative history, specifications, health and safety, design elements, project management and construction procedures are presented in the Remedial Design and Remedial Action Work Plan (RD/RA, RMC 2007b). Sampling was conducted in accordance with the Field Sampling Plan (FSP, RMC 2007c). All work was conducted in accordance with the Richardson Flat Health and Safety Policy, Remedial Investigation (HASP, RMC 2007d)

Work performed in Task 1:

1) Construction of the Wedge Buttress; and
2) Cover placement, grading, confirmation sampling and erosion control structure placement in areas F-1 and F-7 (Figure 1-1).

## 2.0 WORK PROCEDURES

Work was conducted according to procedures presented in the Task 1 FCP.

## 2.1 Wedge Buttress

The Wedge Buttress was constructed to provide additional stability to the existing tailings pond embankment. The buttress design was based on an embankment stability study performed by Applied Geotechnical Engineering Consultants, Inc. (AGEC, 2001) presented in Appendix D of the RD/RA. The Wedge Buttress location is presented in Figure 1-1. Construction procedures for the Wedge Buttress consisted of:

1) Clearing and grubbing the Wedge Buttress footprint of all vegetation and unstable materials.

2) Abandonment of three monitoring wells located within the footprint of the Wedge Buttress. Monitoring well abandonment was conducted in accordance with State of Utah regulations.

3) The base of the buttress was sloped towards the wetland at a five-percent slope.

4) An initial layer of fill, approximately 1.5 feet thick, was placed in the embankment toe area. The fill was placed to provide a working area for construction equipment. The fill was compacted using several passes of tracked equipment.

5) The initial base layer of the buttress was keyed into the natural soils approximately twelve inches below the toe of the tailings embankment. Material for the initial base layer consisted of well-graded rock with no soil. This layer was placed twelve inches deep along the entire width and length of the Wedge Buttress. The material was well graded and consisted of approximately 385 cubic yards (cyds) of three-inch minus well-graded rock.

6) An area of seepage was observed near the east abutment of the embankment. A drainage trench was excavated from the east abutment down to the base of the fill of

the wedge buttress. The trench was excavated to collect seepage and allow it flow away from the embankment. The trench was lined with well-graded rock. No seepage was observed in other areas of the embankment.

7) Approximately 6,385 cyds of four-inch minus rock was placed on top of the base layer. This rock comprised the main body of the Wedge Buttress. The rock was placed at a slope of approximately three horizontal to one vertical extending from the top of the tailings embankment to the toe of the wedge buttress. The rock was compacted using several passes of a bulldozer.

Installation of the Wedge Buttress was overseen by AGEC. AGEC documented that the Wedge Buttress was installed according to specifications in the Wedge Buttress Construction Observation Report presented in Appendix A. The Wedge Buttress construction details are presented in Figure 2-1.

### 2.2 F-1 and F-7

Work activities in areas F-1 and F-7 (Figure 1-1) consisted of the placement and grading of low permeability cover soil as specified in Section 6.0 of the RD/RA and Section 2.1 of the Task 1 FCP. The following activities were completed:

1) Excavation and construction areas were cleared and grubbed prior to the placement of materials. Clearing and grubbing included the removal of organic matter such as plants, trees and woody material, as well as any other material from the Site. Large non-organic materials such as boulders that interfered with grading were removed as required.

2) Appropriate dust control was conducted during all excavation, soil placement, transport and grading activities. Dust control was conducted by wetting work surfaces and haul roads.

3) Additional mine waste material was placed and graded to conform to general Site topography prior to the placement of cover soils.

4) Surfaces and subgrades were graded to approximate final configurations and shapes prior to cover and topsoil placement. Subgrades and final graded surfaces were confirmed by conventional survey techniques where applicable.

5) Imported soils were screened with the X-ray Fluorescence meter (XRF). In addition, five sub-sample composite samples were collected for every 5,000 cyds and sampled with the XRF. Five percent of XRF-sampled imported soil samples were submitted to the laboratory for QA/QC lead and arsenic analysis. All cover materials contained less than 500 ppm lead and 100 ppm arsenic. Sampling was conducted in accordance with protocols and analytical methodologies as described in the FSP. Sample results are presented in Section 4.0. No placement of materials was in restoration areas or areas where the 310 ppm lead limit is in place during this particular Task. All materials used as cover materials complied with the less than 500 ppm lead and 100 ppm arsenic limits.

6) Cover soils used were low permeability, high clay content soils. Large rock material was removed prior to placement. Clay rich soils from an on-Site stockpile were used as cover material using the same criteria outlined in Section 6.1 of the RD/RA and Section 2.2 of the Task 1 FCP for quality control.

7) Cover soils were compacted with tracked or equivalent equipment. Compaction methods also included rolling and/or vibrating, as necessary. Cover soils were inspected and approved by United Park or its representatives prior to topsoil placement.

8) The final cover subgrade was graded to allow for the placement of a consistent topsoil layer.

9) Final surfaces, grades and erosion control structures were approved by United Park or its representative.

10) Completion confirmation sampling is detailed in Section 4.0.

11) Topsoil placement and revegetation will be conducted concurrently with final impoundment closure. This will prevent potential damage to vegetation that may occur during remedy construction in adjacent task areas and allow for consistent revegetation.

## 3.0 STORMWATER MANAGEMENT

Stormwater management was conducted to:

- Reduce the potential for off-Site migration of sediments, soil and tailings; and
- Eliminate the re-contamination of areas that have been covered or have undergone source removal.

General stormwater Best Management Practices (BMPs) included:

- Berms were placed as required to prevent the migration of materials from work areas;
- The banks of the South Diversion Ditch (SDD) contain a vegetative barrier. The vegetative barrier dispersed potential overland flow, reduced velocities and trapped materials prior to reaching the SDD;
- The pond at the downstream end of the SDD was used as a settling pond. The pond provided sufficient settling times for sediment attenuation. The pond will be remediated when all upstream work is complete;
- Sediment basins and diversion channels were constructed on an as-needed basis;
- General grading to direct potential stormwater runoff was conducted as needed;
- Silt fence barriers were placed in appropriate areas that drained from work areas;
- Stormwater runoff protection measures will remain in-place until revegetation efforts are complete.

General BMPs to reduce the tracking of contaminated materials into uncontaminated areas included:

- All trucks and equipment working in contaminated materials (e.g. tailings and sediments) were decontaminated prior to working with clean materials; Decontamination procedures are described in Section 11.8 of the RD/RA;
- A stabilized construction entrance was installed to remove gross contamination for trucks hauling tailings;
- Dust control was conducted as necessary as described in Section 11.1.1 of the RD/RA.

Specific stormwater runoff protection elements implemented prior to and during construction will include:

- Silt fence was placed below the Wedge Buttress construction area. The silt fence prevented the migration of soils into the wetland area.
- The general drainage pattern on the impoundment is from the outer edges towards the center of the impoundment. The inward sloping terrain creates a suitable gradient to ensure that all stormwater is captured on the impoundment. Where needed berms were placed to direct stormwater towards the center of the impoundment.

A Park and Ride facility will be built upon completion of remediation in Area F-7. A separate Stormwater Pollution Prevention Plan will be developed to address construction and operational stormwater runoff mitigation. The paved areas of the parking lot will replace the final vegetative cover where applicable.

## 4.0 COMPLETION CONFIRMATION

Completion of work is based upon confirmation that the following Task 1 Completion Milestones are complete:

1) Completion of the Wedge Buttress;
2) Cover Placement in areas F-1 and F-7 (Figure 2-1) is complete;
3) Reclamation (surface grading and drainage control) is complete; and
4) Confirmation samples verify cover installation meets specifications.

### 4.1 Wedge Buttress

Wedge Buttress completion confirmation was conducted by Applied Geotechnical Engineering Consultants, Inc (AGEC) performing Site inspections during the Wedge Buttress construction. The inspections were conducted to confirm that the Wedge Buttress was conducted in accordance with the recommendations presented in the Stability Evaluation prepared in 2001 and included as Appendix D of the RD/RA.

Based on the observations conducted during construction of the Wedge Buttress, AGEC estimates that the slope stability of the embankment has been increased by a safety factor of at least 1.5. In the professional opinion of AGEC, the construction of the buttress meets the recommendations given in the Stability Evaluation prepared in 2001 and has an adequate safety factor with regards to slope stability. Based on this information, the construction of the Wedge Buttress is complete.

### 4.2 Areas F-1 and F-7

Area F-1 and F-7 cover placement was confirmed using two methodologies:

- Cover thickness confirmation; and
- Confirmation sampling for lead and arsenic concentrations.

Confirmation data was collected on a grid located on 200-foot centers. Sample locations are presented on Figure 4-1

### 4.2.1 Cover Thickness confirmation

The thickness of clean cover was measured at thirty-four locations. Cover sample depths and XRF results are presented are presented in Table 1. The results indicate that cover placement is complete and all areas measured contain at least eighteen inches of cover as specified in the RD/RA and FCP.

### 4.2.2 Imported Soil Sampling

Imported soils were screened with the XRF. In addition, five sub-sample composite samples were collected for every 5,000 cyds and sampled with the XRF. Five percent of XRF-sampled imported soil samples were submitted to the laboratory for QA/QC lead and arsenic analysis. Average lead and arsenic concentrations for all imported soil samples were 63 ppm and <10 ppm, respectively. Lead concentrations ranged from 30 to 220 ppm, arsenic concentrations were below instrument detection limits. Sample results are presented in Table 2. All cover and topsoil contained less than 500 ppm lead and 100 ppm arsenic. Sampling was conducted in accordance with protocols and analytical methodologies as described in the FCP and FSP.

### 4.2.3 QA/QC Sampling

Five-percent of imported soil confirmation samples were submitted to American West Analytical Laboratories for XRF-Lab confirmation. Duplicate laboratory samples were also submitted. Average lead and arsenic concentrations for laboratory confirmation samples were 32.3 ppm and 9.5 ppm, respectively. Analytical laboratory lead concentrations ranged from 29 to 34 ppm, arsenic concentrations ranged from 9.2 to 9.7 ppm. Relative percent differences for XRF and laboratory results were 6.1% for lead and 3.0% for arsenic. QA/QC sample results are presented in Table 3.

## 5.0 REFERENCES

Resource Management Consultants, Inc (RMC), 2007a, Task 1 Field Construction Plan, Richardson Flat, Site ID Number: UT980952840.

Resource Management Consultants, Inc (RMC), 2007b, Remedial Design/Remedial Action Plan (RD/RA), Richardson Flat, Site ID Number: UT980952840, With Attached Work Plan.

Resource Management Consultants, Inc (RMC), 2007c, Field Sampling Plan, Remedial Investigation, Richardson Flat, Site ID Number: UT980952840, With Attached Work Plan.

Resource Management Consultants, Inc (RMC), 2007c, Health and Safety Policy, Remedial Investigation, Richardson Flat, Site ID Number: UT980952840, With Attached Work Plan.